

Amendment to the Claims:

Please amend the claims as follows:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An isolated or recombinant polynucleotide comprising selected from the group consisting of:

a) a polynucleotide encoding [[an enzyme with]] a polypeptide having an aminotransferase activity wherein the amino acid sequence of the polypeptide [[enzyme is]] has at least 70% sequence identity [[identical]] to [[SEQ ID NOS:25-32]]

SEQ ID NO:25, and the aminotransferase activity comprises an aspartate transaminase activity;

SEQ ID NO:26, and the aminotransferase activity comprises an aspartate transaminase activity;

SEQ ID NO:27, and the aminotransferase activity comprises an adenosyl-8-amino-7-oxononanoate aminotransferase activity;

SEQ ID NO:28, and the aminotransferase activity comprises an acetylornithine aminotransferase activity;

SEQ ID NO:29, and the aminotransferase activity comprises an aspartate aminotransferase activity;

SEQ ID NO:30, and the aminotransferase activity comprises a glucosamine:fructose-6-phosphate aminotransferase activity;

SEQ ID NO:31, and the aminotransferase activity comprises a histidinol-phosphate aminotransferase activity; or

SEQ ID NO:32, and the aminotransferase activity comprises a branched chain aminotransferase activity; [[and]] or

b) [[a polynucleotide comprising]] a nucleic acid sequence complementary to a polynucleotide of a).

Claim 2 (currently amended): The isolated or recombinant polynucleotide of claim 1 wherein the polynucleotide [[is]] comprises DNA.

Claim 3 (currently amended): The isolated or recombinant polynucleotide of claim 1 wherein the polynucleotide [[is]] comprises RNA.

Claim 4 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:25.

Claim 5 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:26.

Claim 6 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:27.

Claim 7 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:28.

Claim 8 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:29.

Claim 9 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:30.

Claim 10 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:31.

Claim 11 (currently amended): The isolated or recombinant polynucleotide of claim 1, wherein the polynucleotide [[2 which]] encodes [[the enzyme]] a polypeptide [[of]] comprising a sequence as set forth in SEQ ID NO:32.

Claim 12 (currently amended): The isolated or recombinant polynucleotide [[polynucleotides]] of claim 1 comprising a sequence [[any one of the sequences]] as set forth in [[SEQ ID NOS:17-24]] SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 13 (currently amended): A vector comprising [[the DNA of claim 2]] a polynucleotide sequence as set forth in claim 1.

Claim 14 (original): A host cell comprising the vector of claim 13.

Claims 15 to 16 (Canceled)

Claim 17 (currently amended): A [[nucleic]] probe or a primer comprising a nucleic acid sequence wherein the nucleic acid sequence consists of an oligonucleotide from at least 10 [[to about 50]] nucleotides in length and having a region of nucleotides that is at least 70% sequence identity [[complementary]] to a portion nucleic acid target region of a nucleic acid encoding an amino acid having a sequence as set forth in SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24 selected from the group consisting of SEQ ID NOS:25-32 and which hybridizes to the nucleic acid target region to form a detectable target:probe duplex under conditions that include 0.9 M NaCl, 5.0 mM NaH<sub>2</sub>PO<sub>4</sub>, 5.0 mM Na<sub>2</sub>EDTA, 0.5% SDS, 10X Denhardt's and 0.5 mg/mL polyriboadenylic acid at about 45°C.

Claim 18 (currently amended): The probe or primer of claim 17, wherein the oligonucleotide [[is]] comprises DNA.

Claim 19 (currently amended): The probe or a primer of claim 17, wherein the oligonucleotide comprises a sequence which is at least 90% complementary to the nucleic acid target region.

Claim 20 (currently amended): The probe or a primer of claim [[17]] 19, wherein the oligonucleotide comprises a sequence which is at least 95% complementary to the nucleic acid target region.

Claim 21 (currently amended): The probe or a primer of claim [[17]] 20, wherein the oligonucleotide comprises a sequence which is 100% complementary to the nucleic acid target region.

Claim 22 (currently amended): The probe or a primer of claim 17, wherein the oligonucleotide is 15 to 50 nucleotides in length.

Claim 23 (currently amended): The probe or a primer of claim 17, wherein the probe or a primer further comprises a detectable isotopic label.

Claim 24 (currently amended): The probe or a primer of claim 17, wherein the probe or a primer further comprises a detectable non-isotopic label selected from the group consisting of a fluorescent molecule, a chemiluminescent molecule, an enzyme, a cofactor, an enzyme substrate, and a hapten.

Claim 25 (currently amended): The isolated or recombinant polynucleotide of claim [[2]] 1, wherein the polynucleotide [[which]] encodes an aspartate transaminase [[that is]]

having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in SEQ ID NO:25.

Claim 26 (currently amended): The isolated or recombinant polynucleotide of claim [[2]] 1, wherein the polynucleotide [[which]] encodes an aspartate transaminase [[that is]] having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in SEQ ID NO:26.

Claim 27 (currently amended): The isolated or recombinant polynucleotide of claim [[2]] 1, wherein the polynucleotide [[which]] encodes an adenosyl-8-amino-7-oxononanoate aminotransferase [[that is]] having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in SEQ ID NO:27.

Claim 28 (currently amended): The isolated or recombinant polynucleotide of claim [[2]] 1, wherein the polynucleotide [[which]] encodes an acetylornithine aminotransferase [[that is]] having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in SEQ ID NO:28.

Claim 29 (currently amended): The isolated or recombinant polynucleotide of claim [[2]] 1, wherein the polynucleotide [[which]] encodes an aspartate aminotransferase [[that is]] having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in SEQ ID NO:29.

Claim 30 (currently amended): The isolated or recombinant polynucleotide of claim [[2]] 1, wherein the polynucleotide [[which]] encodes [[an]] a glucosamine:fructose-6-phosphate aminotransferase [[that is]] having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in SEQ ID NO:30.

Claim 31 (currently amended): The isolated or recombinant polynucleotide of claim [[2]] 1, wherein the polynucleotide [[which]] encodes [[an]] a histidinol-phosphate

aminotransferase [[that is]] having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in SEQ ID NO:31.

Claim 32 (currently amended): The isolated or recombinant polynucleotide of claim [[2]] 1, wherein the polynucleotide [[which]] encodes a branched chain aminotransferase [[that is]] having at least 70% sequence identity [[identical]] to the [[enzyme of]] sequence set forth in SEQ ID NO:32.

Claim 33 (currently amended): An or recombinant isolated polynucleotide encoding an enzyme with aminotransferase activity, wherein the polynucleotide encodes [[the]] an enzyme [[of]] having a sequence as set forth in SEQ ID NO:25, SEQ ID NO:26, SEQ ID NO:27, SEQ ID NO:28, SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, or SEQ ID NO:32.

Claim 34 (currently amended): The isolated [[An]] or recombinant polynucleotide of claim 1, wherein the enzyme encoded by the isolated polynucleotide polypeptide has the same amino group acceptor and amino group donor specificity as the enzyme to which it [[is]] has at least 70% [[identical]] sequence identity.

Claim 35 (currently amended): A [[nucleic]] probe or a primer comprising a sequence complementary to the nucleic acid probe of claim 17.

Claim 36 (currently amended): A [[nucleic]] probe comprising (a) a nucleic acid sequence capable of hybridizing consisting of a sequence which hybridizes under hybridization conditions of 0.9 M NaCl, 5.0 mM NaH<sub>2</sub>PO<sub>4</sub>, 5.0 mM Na<sub>2</sub> EDTA, 0.5% SDS, 10X Denhardt's and 0.5 mg/mL polyriboadenylic acid at about 45°C, and a wash for 30 minutes at room temperature in 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na<sub>2</sub> EDTA containing 0.5% SDS, followed by a 30 minute wash in 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na<sub>2</sub> EDTA containing 0.5% SDS at Tm -10°C, to a polynucleotide that encodes a polypeptide having an amino acid sequence as set forth in SEQ ID NO:25, SEQ ID NO:26, SEQ ID NO:27, SEQ ID NO:28, SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, or SEQ ID NO:32

~~selected from the group consisting of SEQ ID NOS:25-32, or (b) a complement of the polynucleotide of (a).~~

Claim 37 (currently amended): A [[nucleic]] probe comprising a nucleic acid sequence ~~eonsisting of a sequence~~ of at least 15 nucleotides complementary or identical to a polynucleotide that encodes an amino acid sequence selected from the group consisting of SEQ ID NOS:25-32.

Claim 38 (previously presented): The probe of claim 37, wherein the nucleic acid sequence ~~eonsists of a sequences~~ of at least 30 complementary or identical nucleotides.

Claim 39 (previously presented): The probe of claim 37, wherein the nucleic acid sequence ~~eonsists of a sequences~~ of at least 50 complementary or identical nucleotides.

Claim 40 (new): The isolated or recombinant polynucleotide of claim 1, wherein the amino acid sequence of the enzyme has at least 80% sequence identity to SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 41 (new): The isolated or recombinant polynucleotide of claim 40, wherein the amino acid sequence of the enzyme has at least 90% sequence identity to SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 42 (new): The isolated or recombinant polynucleotide of claim 41, wherein the amino acid sequence of the enzyme has at least 95% sequence identity to SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 43 (new): The isolated or recombinant polynucleotide of claim 42, wherein the amino acid sequence of the enzyme has at least 97% sequence identity to SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24.

Claim 44 (new): A method for making an enzyme with aminotransferase activity comprising the following steps:

- (a) providing a polynucleotide as set forth in claim 1; and
- (b) expressing the polynucleotide, thereby making an enzyme with aminotransferase activity.

Claim 45 (new): The method of claim 44, wherein the polynucleotide is operably linked to a promoter.

Claim 46 (new): The method of claim 45, wherein the polynucleotide further comprises a vector.

Claim 47 (new): The method of claim 44, wherein the polynucleotide is expressed in a host cell.

Claim 48 (new): The method of claim 47, wherein the host cell is prokaryotic cell or a eukaryotic cell.

Claim 49 (new): A probe or a primer comprising

- (a) a sequence at least 10 nucleotides in length that hybridizes to a sequence as set forth in SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23 or SEQ ID NO:24 under conditions consisting of 0.9 M NaCl, 5.0 mM NaH<sub>2</sub>PO<sub>4</sub>, 5.0 mM Na<sub>2</sub> EDTA, 0.5% SDS, 10X Denhardt's and 0.5 mg/mL polyriboadenylic acid at about 45°C, and a wash for 30 minutes at room temperature in 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na<sub>2</sub> EDTA containing 0.5% SDS, followed by a

30 minute wash in 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na2 EDTA containing 0.5% SDS at Tm -10°C; or,

(b) a sequence complementary to (a).

Claim 50 (new): The probe or a primer of claim 17 or claim 49, wherein the probe or a primer comprises a sequence at least 12 nucleotides in length.

Claim 51 (new): The probe or a primer of claim 50, wherein the probe or a primer comprises a sequence at least 15 nucleotides in length.

Claim 52 (new): The probe or a primer of claim 51, wherein the probe or a primer comprises a sequence at least 30 nucleotides in length.

Claim 53 (new): The probe or a primer of claim 52, wherein the probe or a primer comprises a sequence at least 50 nucleotides in length.

Claim 54 (new): The probe or a primer of claim 17 or claim 49, wherein the probe or a primer consists of a sequence between 15 and 50 nucleotides in length.

Claim 55 (new): The probe or primer of claim 49, wherein the probe or primer further comprises a detectable isotopic label.

Claim 56 (new): The probe or primer of claim 49, wherein the probe or primer further comprises a detectable non-isotopic label.

Claim 57 (new): The probe or primer of claim 56, wherein the detectable non-isotopic label is selected from the group consisting of a fluorescent molecule, a chemiluminescent molecule, an enzyme, a cofactor, an enzyme substrate, a hapten or a combination thereof.